AMENDMENTS

IN THE CLAIMS

1. (cancelled without prejudice) Method for the recording and reading of data on a recording medium (2), using a holographic recording medium with a holographic recording layer (33) having a thickness in the order of wavelength of the reading and recording light, the holographic recording medium being preferably an optical card (2), and holographic write/read apparatus (1) for the recording medium, wherein

the recording of the information is in the form of data pages stored as Fourier holograms recorded in a recording used with, and

polarisation holography with different write and read wavelengths is used,

characterised in using reflected transmission mode holography, and

correcting the distortion during reading in the readout channel caused by the difference between the write and read wavelengths.

2. (cancelled without prejudice) Method according to claim 1, wherein the wavelength distortion is corrected by optical and/or software means.

3. (cancelled without prejudice) Method according to claim 1 or 2, wherein the holograms (61) are recorded as on-axis holograms.

4. (cancelled without prejudice) Method according to any one of the claims 1 to 3, wherein the recording and reading is made with polarisation multiplexing and/or phase-code

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE, 32ND FLOOR
CHICAGO, IL 60606
(312)913-0001

and/or rotational multiplexing.

5. (withdrawn without prejudice) Holographic recording medium, preferably an optical card (2), having a carrier substrate (31), a holographic recording layer (33) sensitive to a reading and/or recording light having a given wavelength, and a reflection layer (32) between the carrier substrate (31) and the recording layer (33), characterised in that the recording layer (33) is a polarisation sensitive polymer material, and the thickness of the recording layer (33) is 0.5-2 times the wavelength of the reading and/or recording light.

6. (withdrawn without prejudice) Holographic recording medium according to claim 5, wherein the reflection layer (32) is a wavelength selective mirror reflecting on the read wavelength and transmitting or absorbing on the write wavelength.

7. (withdrawn without prejudice) Holographic recording medium according to claim 5 or 6, wherein the recording layer (33) is an azobenzene SCP layer.

8. (withdrawn without prejudice) Holographic recording medium according to any one of the claims 5 to 7, wherein the recording layer (33) is covered by a protective layer (34).

9. (cancelled without prejudice) Apparatus for the writing and reading of a holographic recording medium, preferably an optical card (2), having a recording medium holding and/or positioning mechanism (4), movable or fixed read and write optics (9),
the write optics comprising a polarised writing light source (20), polarising selector means (23)

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HULBERT & BERGHOFF LLP
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CHICAGO, IL 60606
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for separating and/or combining a reference beam and an object beam, object beam modulating means (25), polarisation wave plate (24,35), an objective lens (27,47) for imaging the object beam onto a recording layer, and further the read optics comprising a polarised reading light source (21), and a polarising selector (23') and/or spatial filtering means for separating and/or combining the reference beam and an image beam, a light detector (29) and an objective lens (28,47) for imaging the image beam onto the light detector (29),

characterised in that the wavelength of the reading light source (21) is different from the writing light source (20), and

the read optics comprise wavelength distortion correcting means for correcting the distortion of the reconstructed image caused by the difference in the wavelength of the reading and writing light.

10. (cancelled without prejudice) Apparatus according to claim 9, wherein the wavelength of the writing light source (20) is between 400-550 nm, and the wavelength of the reading light source (21) is between 600-700 nm.

11. (currently amended) Apparatus for the writing and reading of a holographic recording medium, preferably an optical card (2), having a recording medium holding and/or positioning mechanism (4), movable or fixed read and write optics (9),

the write optics comprising a polarised writing light source (20), polarising selector means (23) for separating and/or combining a reference beam and an object beam, object beam modulating means (25), polarisation wave plate (24,35), an objective lens (27,47) for imaging the object beam onto a recording layer, and further the read optics comprising a polarised reading light

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HULBERT & BERGHOFF LLP
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CHICAGO, IL 60606
(312)913-0001

source (21), and a polarising selector (23') and/or spatial filtering means for separating and/or combining the reference beam and an image beam, a light detector (29) and an objective lens (28,47) for imaging the image beam onto a the light detector (29),

characterised in that the wavelength of the reading light source (21) is different from the writing light source (20), and

the read optics comprise wavelength distortion correcting means for correcting the distortion of the reconstructed image caused by the difference in the wavelength of the reading and writing light

wherein the wavelength distortion correcting means of the read optics comprise an aspherical plastic objective lens (48).

12. (cancelled without prejudice) Apparatus according to any one of the claims 9 to 11, wherein the object beam and the reference beam in the read optics and/or the write optics have a common optical axis, and the polarising selector means comprise a polarisation selective beam splitter (23) and/or the spatial filtering means comprise a beam stop (36) for separating the reflected reference beam (18') from the reflected object beam (17).

13. (cancelled without prejudice) Apparatus according to any one of the claims 9 to 12, wherein polarisation encoder means (26) are provided in the optical path of the reference beam (18).

14. (cancelled without prejudice) Apparatus according to claim 13, wherein the polarisation encoder means are comprising a Liquid Crystal Spatial Light Modulator.

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CHICAGO, IL 60606
(312)913-0001

15. (cancelled without prejudice) Apparatus according to any one of the claims 11 to 14, wherein the read optics and the write optics have a common objective lens (47) for imaging the reference and object beams (18,16) onto a recording layer and for imaging the reflected object beams (17) onto the read detector (29).

16. (currently amended) Apparatus according to claim 11, wherein the read optics and the write optics have a common objective lens (47) for imaging the reference and object beams (18,16) onto a recording layer and for imaging the reflected object beams (17) onto the read detector (29), and

wherein the common objective lens is an aspheric lens (48) for the correction of the wavelength distortion, the aspheric lens (48) having a central region (49) and an annular region (50) in its aperture, where the central region (49) of the aspheric lens is tuned to the wavelength of the writing light source (20) for focusing the write object beam (17) onto the recording layer (33), and at the same time tuned to the wavelength of the read light source (21) for imaging the read object beam (17) onto the detector (29), and further the annular region (50) of the lens (48) is tuned to the wavelength of the read light source (21) for imaging the reflected object beam (17) onto the detector.

17. (cancelled without prejudice) Holographic data storage system with a holographic recording medium (2) and a read/write apparatus (3) for the holographic recording medium (2), particularly with the recording medium according to claim 5 and for a read/write apparatus according to claim 9,

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE, 32ND FLOOR
CHICAGO, IL 60606
(312)913-0001

characterised in utilising reflected transmission and polarisation holograms with different read and write wavelength, together with distortion correction means (47) for correcting the distortion caused by the difference between the read and write wavelength.

18. (cancelled without prejudice) The system according to claim 17, wherein the data storage capacity is multiplied by polarisation and/or phase code and/or rotational multiplexing.

19. (cancelled without prejudice) Method for coding of the recorded information on a holographic optical recording medium, preferably an optical card (2), where the information is recorded in the form several discrete holograms (61) and/or subholograms recorded in different physical and/or logical recording locations on the optical recording medium (2), the holograms (61) containing data sets, where the sequence of the data sets together constitute the recorded information,

characterised in that the data sets are recorded in a random sequence of the recording locations.

20. (cancelled without prejudice) The method according to claim 19, wherein the information is recorded in multiplexed holograms (61), and the logical recording locations are identified by the multiplexing address.

21. (cancelled without prejudice) The method according to claim 20, wherein the information is recorded by polarisation holography using phase-code multiplexing, where one hologram (61) contains several phase-coded multiplexed holograms, and the logical recording locations are identified by the phase code address.

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22. (cancelled without prejudice) The method according to any one of the claims 19 to 21, wherein the location of the first data set is stored, and the location of the following data sets are stored in the previous data sets.

23. (cancelled without prejudice) The method according to any one of the claims 19 to 22, wherein the random sequence of the data sets are stored and encrypted and/or made inaccessible for unauthorised users.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE, 32ND FLOOR
CHICAGO, IL 60606
(312)913-0001